



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title: STREAMING SWITCH FABRIC  
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**We claim:**

1. A stream switch fabric comprising:  
at least one stream queue that operates to receive and store a plurality of properly ordered substreams of a data stream from a producer of the data stream; and  
a stream queue controller, coupled to said at least one stream queue, that operates to control outputting of at least a portion of the data within the at least one stream queue to a consumer of the stream queue.
2. A fabric according to claim 1, wherein the stream queue controller operating to control outputting of at least a portion of the data within the at least one stream queue to a consumer of the stream queue comprises triggering forwarding of a copy of at least a portion of the data within the stream queue to a consumer of the stream queue.
3. A fabric according to claim 1, wherein the stream queue controller operating to control outputting of at least a portion of the data within the at least one stream queue to a consumer of the stream queue comprises triggering forwarding of at least a portion of the data within the stream queue to a consumer of the stream queue and deleting of this portion of the data within the

stream queue.

4. A fabric according to claim 1, wherein the stream queue controller operating to control outputting of at least a portion of the data within the at least one stream queue to a consumer of the stream queue comprises reading a consumer attribute for the stream queue to determine an assigned consumer of the stream queue and triggering outputting of a portion of the data within the stream queue to the assigned consumer.

5. A fabric according to claim 1, wherein the stream queue controller operating to control outputting of at least a portion of the data within the at least one stream queue to a consumer of the stream queue comprises selecting a consumer as a consumer for the stream queue based upon a predetermined criteria and triggering outputting of a portion of the data within the stream queue to the selected consumer.

6. A fabric according to claim 1, wherein the stream queue controller further operates to receive a control signal associated with the at least one stream queue.

7. A fabric according to claim 6, wherein the control signal comprises an indication of at least one consumer attribute for the at least one stream queue.

8. A fabric according to claim 7, wherein the consumer attribute comprises the consumer that is assigned as the consumer of the stream queue.

9. A fabric according to claim 7, wherein the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue.

10. A fabric according to claim 6, wherein the control signal comprises an instruction to trigger copying of at least a portion of the data within the stream queue to the consumer of the stream queue.
11. A fabric according to claim 6, wherein the control signal comprises an instruction to trigger forwarding of at least a portion of the data within the stream queue to the consumer of the stream queue and deleting of this portion of the data within the stream queue.
12. A fabric according to claim 6, wherein the at least one stream queue comprises a plurality of stream queues and the control signal comprises an instruction to trigger transferring of at least a portion of the data within the stream queue to a second stream queue of the plurality of stream queues.
13. A fabric according to claim 1, wherein the at least one stream queue comprises a plurality of stream queues and the plurality of stream queues are hierarchical.
14. A fabric according to claim 1, wherein the at least one stream queue comprises at least one register.
15. A fabric according to claim 1, wherein said at least one stream queue comprises at least one buffer.
16. A fabric according to claim 1, wherein the stream queue controller comprises at least one application specific integrated circuit.
17. A fabric according to claim 1, wherein the stream queue controller comprises at least one reduced instruction set computer processor.

18. A fabric according to claim 1, wherein the stream queue controller comprises at least one complex instruction set computer processor.
19. A stream switch fabric comprising:
  - reception means for receiving a plurality of properly ordered substreams of a data stream from a producer of the data stream;
  - storage means for storing the substreams; and
  - control means for controlling outputting of at least a portion of the data within the means for storing the substreams to a consumer of the data stream.
20. A fabric according to claim 19, wherein the control means comprises copy means for copying at least a portion of the data within the means for storing the substreams and forwarding means for forwarding the copy of the at least a portion of the data.
21. A method of processing streams of data comprising:
  - receiving properly ordered substreams of a data stream;
  - storing the substreams within a stream queue associated with the data stream; and
  - outputting at least a portion of the data within the stream queue to a consumer of the stream queue.
22. A method according to claim 21, wherein the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises forwarding a copy of at least a portion of the data within the stream queue to a consumer of the stream queue.
23. A method according to claim 21, wherein the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises forwarding at least a portion of the data within the stream queue to a

consumer of the stream queue and deleting this portion of the data within the stream queue.

24. A method according to claim 21, wherein the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises reading a consumer attribute for the stream queue to determine an assigned consumer of the stream queue and outputting a portion of the data within the stream queue to the assigned consumer.

25. A method according to claim 21, wherein the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises selecting a consumer as a consumer for the stream queue based upon a predetermined criteria and outputting a portion of the data within the stream queue to the selected consumer.

26. A method according to claim 25, wherein the predetermined criteria comprises a round robin system.

27. A method according to claim 25, wherein the predetermined criteria comprises a determination of a least burdened consumer.

28. A method according to claim 21 further comprising receiving a control signal associated with the stream queue from the consumer of the stream queue.

29. A method according to claim 28, wherein the control signal comprises an indication of at least one consumer attribute for the stream queue.

30. A method according to claim 29, wherein the consumer attribute comprises the consumer that is assigned as the consumer of the stream queue.

31. A method according to claim 29, wherein the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue.
32. A method according to claim 28, wherein the control signal comprises an instruction to copy at least a portion of the data within the stream queue to the consumer of the stream queue.
33. A method according to claim 28, wherein the control signal comprises an instruction to forward at least a portion of the data within the stream queue to the consumer of the stream queue and delete this portion of the data within the stream queue.
34. A method according to claim 28, wherein the control signal comprises an instruction to transfer at least a portion of the data within the stream queue to another stream queue.
35. A fabric according to claim 5, wherein the predetermined criteria comprises a round robin system.
36. A fabric according to claim 5, wherein the predetermined criteria comprises a determination of a least burdened consumer.